

(Hemi-Sync® Journal, Vol. X, No. 3, Summer 1992)

LABORATORY EVALUATION: THE EFFICACY OF HEMI-SYNC® FREQUENCIES

by *F. Holmes Atwater*

F. Holmes Atwater is coordinator of TMI's Brainmapping Project. A retired military officer, he has been a college instructor, scientific investigator, and behavioral engineer, and has completed graduate work in counseling psychology. His specialty is the design and application of techniques for cultivating propitious states of consciousness.

To be effective, Hemi-Sync® frequencies must promote more than simple changes in consciousness. Many stimuli can be used to change consciousness, but few are able to provide the participant with the opportunity for a transcendent experience or, as Bob Monroe says, a "different overview." All research conducted by the Institute is directed solely to the development of methods and techniques that will aid others in evolution and growth of human consciousness and perception. In accordance with this position the TMI Laboratory continually evaluates the effectiveness of the Hemi-Sync process. This includes the Hemi-Sync cassette tapes, Hemi-Sync formats used in TMI educational programs, special-application Hemi-Sync patterns, and the administration of the Hemi-Sync process in individual PREP sessions in the lab. As research progresses and technology permits, improved and/or special-purpose Hemi-Sync frequency combinations are developed and evaluated. With the advent of newly developed computer software, the TMI lab can now evaluate the efficacy of the Hemi-Sync process to a degree never before available.

Last year an independent psychophysiological study of the Hemi-Sync process was conducted to determine if the technique could enhance the induction of transcendent experiences. This study was conducted by The Colorado Association for Psychophysiological Research, 1013 Twin Sisters Road, Nederland, Colorado 80466. One of the findings of this study was that at baseline (an EEC recording taken before any stimulation) and during stimulation with pink noise, alpha brain-wave activity was confined to the cortex behind the Sylvian sulcus (back of the head). In the profession, this condition is known as "resting-state-alpha." As the Hemi-Sync stimulation began, this predominant alpha activity decreased and a flowing, dynamic pattern of EEC activity accompanied transcendent experiences in the subjects. The study concluded that binaural beat stimulation as presented in the Hemi-Sync process appeared to provoke progressive EEC activity accompanied by subjective reporting of transcendent experiences. Of interest here, in the following paragraphs, are the study's findings of amplitude suppression of alpha in response to binaural Hemi-Sync stimulation.

Alpha suppression is being studied by researchers and therapists who use theta biofeedback as a component in the treatment of drug and alcohol abuse and obesity. These researchers believe that alpha suppression identifies or is required to "trigger" or "initiate" transcendent

experiences. (Unpublished data reported independently by Ed Wilson, MD, and Fowler Jones, PhD.) Using a Neuromagnetometer and brain mapping with SQUID technology, researchers at New York University have been studying alpha suppression as well. They believe that regional alpha suppression may indicate access to thought processes. Over the last three years of the TMI Brainmapping Project, alpha suppression behind the Sylvian sulcus has been the most dependable indicator of an effective response to Hemi-Sync sound patterns. The Colorado Association for Psychophysiological Research reports that un suppressed alpha may be a stabilizing force, providing one with familiar modes of processing perceived data. Without the suppression of persistent resting-state-alpha one cannot obtain a different overview.

The characteristic EEC parameters of resting-state-alpha reveal the individual's temperament, the way in which the individual processes and interacts with the world he or she perceives. The EEC parameters of interest relate to frequency, amplitude, band width, and the level of dynamic activity. An individual with a static, medium to high frequency (9-11 Hz), high amplitude, narrow band resting-state-alpha relates to the perceived world differently than an individual with alternative parameters. These differences are testable using standardized profiles like the Meyers-Briggs Type Indicator (MBTI). The ability to modify resting-state-alpha directly affects one's experience of one's environment. If one moves toward an experience in an expanded state of consciousness and retains one's innate resting-state-alpha, one will relate to the perceptual environment of this experience equipped with one's familiar repertoire of acumen. As a result, the altered state experience lacks fidelity and depth of field and provides little insight. Alternatively, if one moves toward an experience in an expanded state of consciousness without one's innate resting-state-alpha, one will relate to the perceptual environment of this experience from a novel perspective. Changing one's resting-state-alpha effectively transforms one's perceptual venue.

Amplitude suppression of resting-state-alpha is only one of the alterations that are possible with the Hemi-Sync process. The mixing of numbers of binaural beat frequencies generates an audioencephalographic interferometry effect which can be used to transform innate resting-state-alpha or reinforce beneficial alpha states. Some "Focus Level" Hemi-Sync frequencies used do not interfere with resting-state-alpha and allow the listener to integrate and relate to "tape experiences" in his or her everyday, familiar life. Other Hemi-Sync frequencies endeavor to alter resting-state-alpha to provide listeners with high-fidelity, rich "Focus Level" experiences and, ultimately, a different overview.

Following is an example of the research involved in the development of a new set of Hemi-Sync frequencies. A series of Hemi-Sync tones were assembled and were used as stimuli for experimental subjects. Brain waves were monitored using a 20-channel computerized EEC (Neurosearch-24, Lexicor, Boulder, Colorado). Figure 1 illustrates alpha brain-wave amplitude in microvolts for experimental Subject 1. Notice that exposure to the Hemi-Sync stimuli BF4, BF10, and BF12 suppresses baseline or resting-state-alpha.

Many people have asked, from a research point of view, how we know that an individual's resting-state-alpha would not change anyway, without Hemi-Sync stimulus. Figure 2 illustrates alpha brain-wave amplitude in microvolts for experimental Subject 2. In this case, however, no Hemi-Sync stimulus was provided. As you can see, there is no suppression of resting-state-alpha.

For the next experiment we exposed Subject 2 to the same Hemi-Sync frequencies that were used for Subject 1. Figure 3 shows even greater suppression of resting-state-alpha during Subject 2's exposure to the Hemi-Sync stimuli BF4, BF10, and BF12.

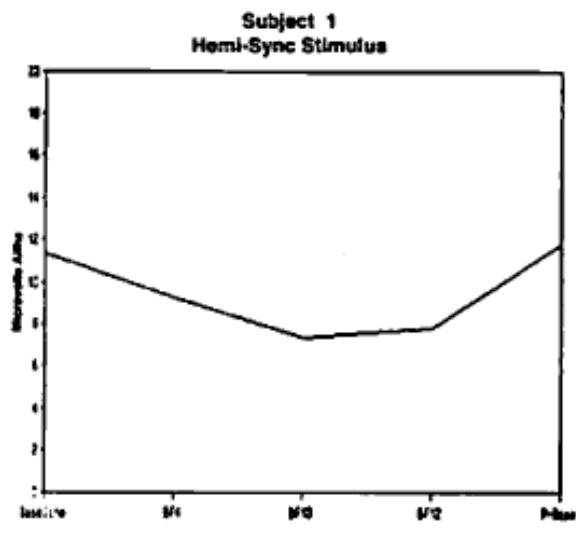


Figure 1

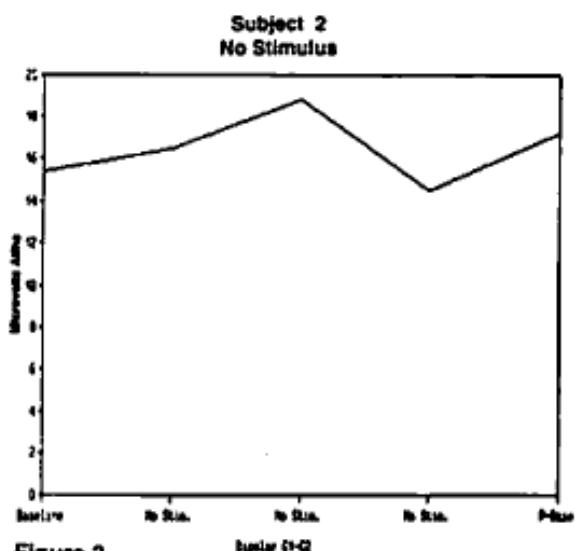


Figure 2

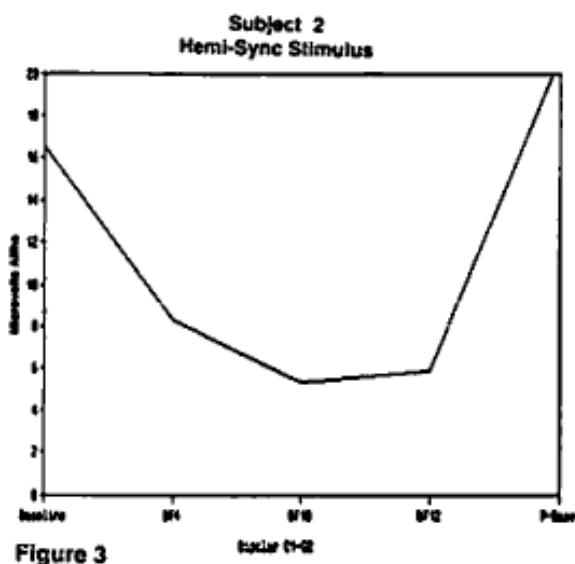


Figure 3

As stated previously, amplitude suppression of resting-state-alpha is only one of the alterations that are possible with the Hemi-Sync process. Band width and frequency can also be affected. Figure 4 illustrates the baseline average amplitude in microvolts of Subject 1's resting-state-alpha. The graph shows a wide band, low frequency, moderate amplitude alpha pattern. Figure 5 illustrates the BF10 average amplitude in microvolts of Subject 1's Hemi-Sync state. This graph shows a wider band, lower frequency, lower amplitude alpha pattern than that of baseline.

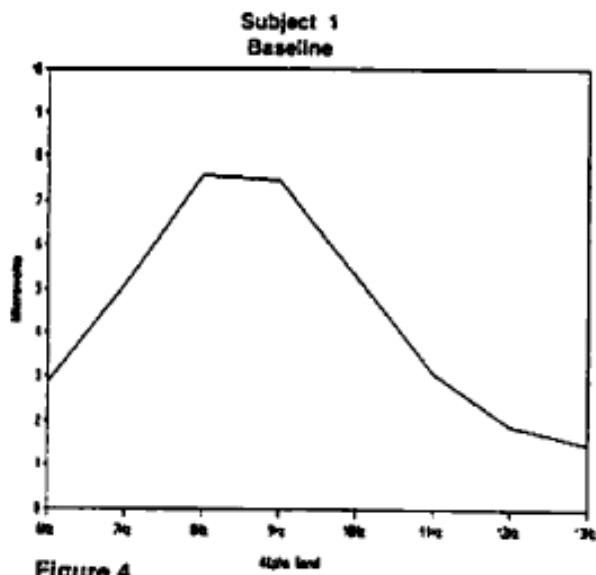


Figure 4

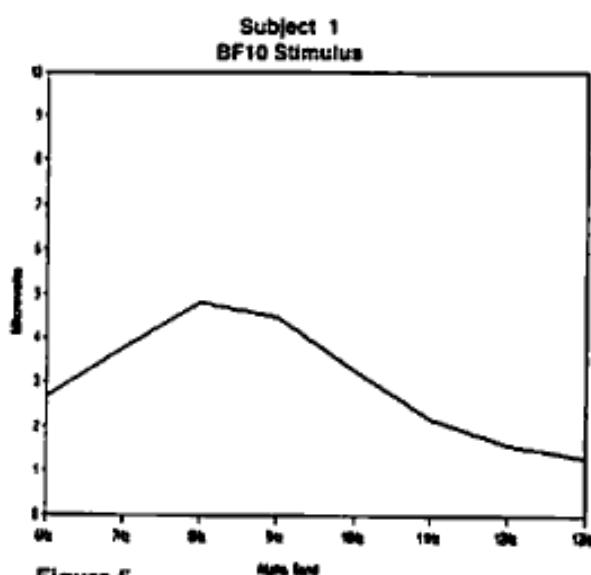
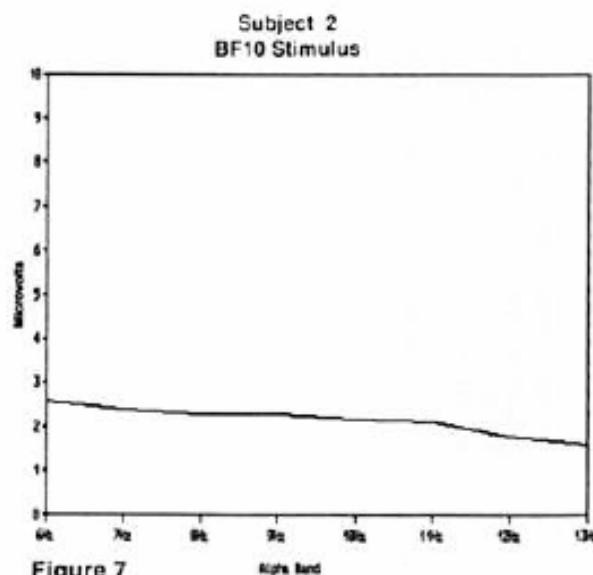
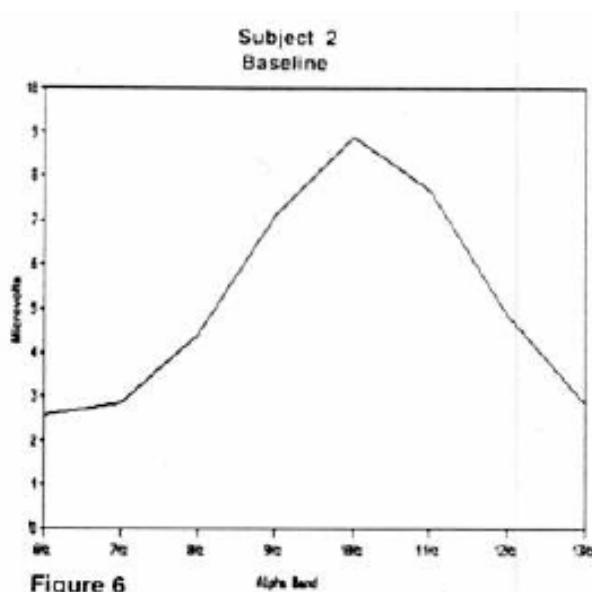


Figure 5

Turning now to Subject 2, Figure 6 depicts the baseline average amplitude in microvolts of Subject 2's resting-state-alpha. Subject 2 has a higher frequency, higher amplitude resting-state-alpha pattern than does Subject 1. Figure 7 describes the BF10 average amplitude in microvolts of Subject 2's Hemi-Sync state. This graph shows a very wide band, very low frequency, very low amplitude alpha pattern. Subject 2 seems to have been affected more profoundly than Subject 1 by the Hemi-Sync stimulus.



So whatever happened to hemispheric synchronization? The coined term “Hemi-Sync” has always been descriptive of coherent brain-wave activity in response to the Hemi-Sync binaural stimuli. New software just made available for the Neurosearch-24 enables direct measurement of this brainwave synchrony. This information is available for biofeedback during a training session or for later analysis of brain-wave activity.

With reference to our two subjects mentioned above, Figure 8 depicts a rise in the percent of brain-wave synchrony from that of baseline when Subject 1 is exposed to the Hemi-Sync stimuli. Curiously, the percent of brain-wave synchrony remains high during the postbaseline period. Reviewing Figure 1, Subject 1's resting-state-alpha returns during postbaseline. This paradox was evident in the behavior of Subject 1 immediately after the experiment. The subject appeared slightly disoriented or “ungrounded,” as the saying goes around here. Within a few minutes, physical activity restored the subject's normal orientation. Left undisturbed, the subject would probably have drifted off to sleep.

Figure 9 shows the rise in the percentage of brain-wave synchrony from that of baseline when Subject 2 is exposed to the Hemi-Sync stimuli. In this case the percentage of brainwave synchrony diminishes when the Hemi-Sync stimulus stops. Compare the inverse congruence of Figure 3 and Figure 9. This subject moves from normal waking consciousness (resting-state-alpha) into a high-fidelity, rich experience in an expanded state of consciousness and returns well “grounded,” ready to participate in Focus 1 activities.

The Hemi-Sync process promotes more than simple changes in consciousness. Hemi-Sync provides the opportunity for a transcendent experience, an escapade beyond the narrow confines of familiar knowledge.

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